

CLAIMS

1. A connector assembly, including:
 - a connector housing having a contact retaining chamber at one end of said connector housing;
 - at least two signal contacts arranged as a differential pair and held in said contact retaining chamber of said connector housing, said at least two signal contacts being separated by a gap;
 - an impedance tuner block insertable into said contact retaining chamber, said impedance tuner block having at least two channels notched therein, said impedance tuner block including isolation layers formed of a dielectric material and separating said channels, each channel receiving a corresponding one of said signal contacts and each isolation layer being inserted between adjacent signal contacts when said impedance tuner block is inserted into said contact retaining chamber.
2. The connector assembly of claim 1 wherein said impedance tuner block includes a plurality of isolation ribs as said isolation layers, wherein one of said plurality of isolation ribs is positioned between two adjacent signal contacts.
3. The connector assembly of claim 1 further including ground contacts separating said differential pairs, wherein said impedance tuner block includes a plurality of isolation ribs as said isolation layers, said differential pairs being separated from said ground contacts by said isolation ribs.
4. The connector assembly of claim 1 further including at least one impedance adjusting insert securable to said impedance tuner block in a position that is oriented parallel to a portion of said signal contacts.
5. The connector assembly of claim 1 further including a metal insert securable to said impedance tuner block adjacent to said at least two channels to overlap corresponding signal contacts received in said at least two channels.

6. The connector assembly of claim 1 further including an impedance adjusting member held in said contact receiving chamber adjacent a corresponding differential pair.

7. An apparatus for controlling impedance within an electrical connector assembly including a housing; a cavity; and a plurality of signal and ground contacts held in and exposed within the cavity, the signal contacts being arranged in differential pairs, said apparatus comprising:

an impedance tuner formed of a dielectric material different than air and adapted to be interchangeably secured in the cavity in the housing, said impedance tuner including a plurality of dielectric isolation ribs along a side of said impedance tuner mating the with signal contacts, said impedance tuner being positioned within the cavity proximate the signal and ground contacts, wherein the tails on signal contacts of the differential pairs are separated from tails on the ground contacts by said isolation ribs.

8. The apparatus of claim 7 wherein one of said plurality of isolation ribs is adapted to be positioned between every signal contact.

9. The apparatus of claim 7 wherein said impedance tuner further includes:

at least one impedance adjusting metal insert removably secured to said impedance tuner, said at least one impedance adjusting metal insert being oriented parallel to said signal contacts, and said at least one metal insert overlaps a portion of one of the differential pairs of signal contacts.

10. The connector assembly of claim 7 further including a metal insert securable to said impedance tuner block adjacent said at least two channels to overlap corresponding signal contacts received in said at least two channels.

11. A system for controlling impedance within an electrical connector assembly, comprising:

an electrical connector including:

a housing;

a cavity; and

a plurality of signal contacts and ground contacts held in, and exposed from, said cavity, said signal contacts being arranged in differential pairs;

an interchangeable impedance tuner formed of a dielectric material different than air, said interchangeable impedance tuner, comprising:

an impedance adjusting metal insert; and

an insert receptacle for receiving said at least one metal insert,

said impedance tuner being positioned within said cavity proximate said plurality of signal contacts and ground contacts, wherein said impedance adjusting metal insert is oriented parallel to said signal contacts, and wherein said impedance adjusting metal insert overlaps at least two signal contacts.

12. The system of claim 11 wherein said interchangeable impedance tuner includes a plurality of dielectric isolation ribs, wherein one of said plurality of dielectric isolation ribs is positioned between two adjacent signal and ground contacts.

13. The system of claim 11 wherein said interchangeable impedance tuner includes a plurality of dielectric isolation ribs, wherein one differential pair of signal contacts is separated from a ground contact by at least one of said dielectric ribs.

14. The system of claim 11 wherein said at least one impedance adjusting metal insert is a non-ferrous metal.

15. A system for controlling impedance within an electrical connector assembly, comprising:

an electrical connector including:

a housing;

a cavity; and

a plurality of signal contacts and ground contacts held in, and exposed from, said cavity, said signal contacts being arranged in differential pairs;

an interchangeable impedance tuner formed of a dielectric material different than air, said interchangeable impedance tuner including:

a plurality of dielectric isolation ribs;

an impedance adjusting metal insert; and

an insert receptacle for receiving said at least one metal insert,

said impedance tuner being positioned within said cavity proximate said plurality of said signal contacts and ground contacts, wherein one of said plurality of dielectric isolation ribs is positioned between two adjacent signal and ground contacts, wherein said impedance adjusting metal insert is oriented parallel to said signal contacts, and wherein said impedance adjusting metal insert overlaps at least two signal contacts.

16. The system of claim 15 wherein said one of said plurality of dielectric ribs is positioned between two adjacent signal and ground contacts.

17. The system of claim 15 wherein said at least one metal insert is a non-ferrous metal.